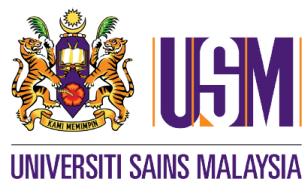


**ASSESSMENT OF KNOWLEDGE, ATTITUDE AND
CONFIDENCE LEVEL ON DISASTER MANAGEMENT
AMONG HEALTHCARE PROFESSIONAL IN MALAYSIAN
MILITARY**

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LIST OF SYMBOLS, ABBREVIATIONS

EMS	Emergency Medical Services
SPSS	Statistical Package for the Social Sciences
WHO	World Health Organization
NSC	National Security Council
CBRNe	Chemical, Biological, Radiological, Nuclear and explosion
DMRC	Disaster Management & Relief Committee
KAC	Knowledge, Attitude, Confidence
MCI	Mass Casualty Incident
MAFHS	Malaysian Armed Forces Health Service
NADMA	National Disaster Management Agency
MOOTW	Military Operations Other Than War
NDMRC	Natural Disaster Management and Relief Committee
SMART	Special Malaysia Disaster Assistance and Rescue Agency
MAF	Malaysian Armed Forces
HAT	Hospital Angkatan Tentera
SpRs	Specialist Registrar

ABSTRAK

Pengenalan

Bencana adalah peristiwa yang boleh menyebabkan kerugian besar dan menyebabkan kehilangan nyawa yang banyak semasa kejadian. Ia boleh disebabkan oleh kejadian semula jadi termasuk banjir, panas melampau, kebakaran hutan, atau bencana buatan manusia seperti gempa bumi, kebakaran, kemalangan pengangkutan, kemalangan industri, tumpahan minyak, serangan pengganas, letupan nuklear / radiasi nuklear dan perang. Kesiapsiagaan bencana merupakan elemen penting dalam pengurangan risiko bencana dan pengurusan bencana.

Objektif

Kajian ini bertujuan untuk menilai tahap pengetahuan, sikap dan keyakinan pengurusan bencana di kalangan kakitangan perubatan Perkhidmatan Kesihatan Angkatan Tentera Malaysia (MAFHS) dan untuk mencari faktor-faktor berkaitan yang menyumbang kepada tahap pengetahuan, sikap dan keyakinan terhadap pengurusan bencana.

Kaedah Kajian

Kajian ini merupakan kajian keratan rentas dan telah dijalankan pada November 2021 hingga Mac 2022 di 3 buah hospital pengajian tinggi di bawah MAFHS. Soal selidik yang disahkan mengandungi 31 soalan berdasarkan demografi, pengetahuan, sikap dan keyakinan mengenai pengurusan bencana. Data tersebut dimasukkan dan dianalisis menggunakan perisian SPSS versi 26.

Keputusan

Seramai 210 kakitangan perubatan mengambil bahagian dalam kajian ini. Kebanyakan mereka adalah pemegang diploma (n (%) = 171 (81.4)) dan bekerja sebagai Pembantu

Pegawai Perubatan dan jururawat. Minoriti daripada mereka mempunyai pengalaman dalam pengurusan bencana (n (%) = 48 (22.9)) dan mempunyai sejarah menyertai kursus bencana atau mana-mana latihan yang berkaitan dengan pengurusan bencana (n (%) = 34 (16.2)). Skor purata untuk pengetahuan ialah 20.41 daripada jumlah skor 28 dengan $SD = 2.29$ dan berada di bawah kategori purata. Skor mean sikap ialah 9.67 daripada jumlah skor 10 dengan $SD = 0.73$ dan kesemua peserta menunjukkan sikap yang Positif. Skor purata untuk keyakinan hanya 1.19 daripada jumlah skor 7 dengan $SD = 1.96$ dan berada di bawah kategori keyakinan yang rendah dan hanya terdapat 31(14.8%) daripada peserta mendapat keyakinan tinggi. Faktor yang berkaitan untuk pengetahuan adalah penyertaan dalam kursus bencana atau latihan bencana (p -value-0.009) dan umur >40 tahun (p -value = 0.033). Faktor yang berkaitan dengan sikap adalah pengalaman dalam pengurusan bencana (p -value = 0.020) dan jantina (p -value = 0.024). Terdapat 85.2% ($n=179$) kakitangan perubatan tidak yakin dengan pengurusan bencana. Faktor yang berkaitan bagi tahap keyakinan adalah pengalaman dalam pengurusan bencana (p -value-0.001) dan tahap pendidikan (p -value = 0.006).

Kesimpulan

Hasil kajian menunjukkan bahawa kakitangan perubatan di MAFHS mempunyai kategori pengetahuan yang sederhana dan tahap keyakinan yang rendah, berpotensi meningkatkan risiko pengurusan yang tidak teratur dan lemah dalam pengurusan bencana. Penyertaan dalam kursus bencana dan latihan berkaitan pengurusan bencana, berumur lebih daripada 40 tahun adalah faktor yang berkaitan yang menyumbang kepada tahap pengetahuan di kalangan profesional penjagaan kesihatan manakala pengalaman dalam pengurusan bencana, dan tahap pendidikan dikalangan kakitangan perubatan mempengaruhi keyakinan mereka. Oleh itu, latihan yang dirancang dan teratur mengenai pengurusan bencana adalah wajib untuk meningkatkan tahap

pengetahuan dan tahap keyakinan mereka. Kebanyakan peserta menunjukkan sikap yang sangat positif dalam pengurusan bencana.

Kata Kunci: Pengetahuan, Sikap, Keyakinan, Pengurusan Bencana, Profesional Penjagaan Kesihatan, Ketenteraan,

ABSTRACT

Background

Disaster is an event which can lead to huge amounts of losses and may cause a lot of live during the event. It can be caused by natural events such as floods, extreme heat, wildfires, or man-made disasters such as stampedes, fires, transport accidents, industrial accidents, oil spills, terrorist attacks, nuclear explosions/nuclear radiation, and war. Therefore, disaster preparedness is an important in disaster risk reduction and management.

Objectives

The study aims to assess the level of knowledge, attitude, and confidence in disaster management among healthcare professional staff of Malaysian Armed Forces Health Service (MAFHS) and to look for the associated factors that contribute to the level of knowledge, attitudes and confidence in disaster management.

Methods

This cross-sectional study was conducted from November 2021 to March 2022 in 3 tertiary hospitals under MAFHS. The validated questionnaire consisted of 31 questions based on demography, knowledge, attitude, and confidence regarding disaster management. The data was keyed in and analysed using software SPSS version 26.

Results

A total of 210 healthcare professionals participated in the study. Majority were diploma holder (n (%) = 171 (81.4)) and working as assistant medical officers and nurses. Minority of them had experience in disaster management (n (%) = 48 (22.9)) and had history of participating in disaster course or any training related to disaster management

(n (%) = 34 (16.2)). The mean score for knowledge was 20.41 from total score of 28 with SD = 2.29 which was under category average. The mean attitude score was 9.67 from a total score of 10 with SD = 0.73, showing a positive attitude. The mean score for confidence was only 1.19 from total score of 7 with SD = 1.96 which was under category of low confidence and there was only 31(14.8%) of the participant scored high confidence. The associated factors for knowledge were participation in disaster course or drill (p-value=0.009) and age >40 years (p-value=0.033). The associated factors for attitude were experienced in disaster management (p-value=0.020) and gender (p-value=0.024). Eighty-five percent (n=179) of healthcare professionals had no confident in disaster management. The associated factors for confidence were experience in disaster management (p-value=0.001) and level of education (p-value=0.006).

Conclusions

The findings revealed that healthcare professionals in MAFHS had average knowledge and low confidence level, potentially increasing the risk of uncoordinated and poor disaster management. Participation in disaster courses and drills, and age more than 40 years old were the factors contributing to knowledge level among healthcare professionals whereas experience in disaster management, and education level among healthcare professionals influence their confidence. Thus, adequately planned, and regular training on disaster management is mandatory to improve knowledge and confidence level. Otherwise, most of the participants show excellent attitudes in disaster management.

Keywords: Knowledge, attitude, Confidence, Disaster Management, Healthcare Professional, Military.

CHAPTER 1.0 INTRODUCTION

Malaysia is a blessed country, spared from severe major natural disasters such as severe earthquake, volcanic eruption and typhoon¹. However, other types of natural disasters like floods, landslides, severe haze, and also man-made disaster such as large-scale accident or biochemical hazard contamination are still happening in Malaysia^{1,2}. Flood are the most frequent natural disaster in Malaysia with significant number of human lives lost, disease epidemics, property and crop damage and other losses².

On 11 December 1993, Malaysia was shocked by a major incident when a block of building collapsed in the Highland Tower. At that time, we can see how we were still lacking in planning disaster management, standardized rules and regulation, and local expertise in specialized rescue operations. These issues were noticed by the government and prompted them to review the existing provisions for disaster management and institute a new mechanism for disaster relief and management³. Ever since, the government began to improve disaster management planning, establishing National Security Council and Directive No.20; on the Policy and Mechanism on National Disaster Relief and Management. Directive No.20, Malaysia's main policy for disaster management, guides the agencies across the nation in managing disaster and its aftermath. The National Disaster Management Agency (NADMA) currently run Disaster management in Malaysia⁴.

WHO has defined disaster as an occurrence disrupting the normal conditions of existence and causing a level of suffering that exceeds the affected community's capacity to adjust⁵. According to NSC directive no 20, a disaster is an event that disrupt the activities of public and state affairs, involving loss of life, property damage, economic losses and environmental damage that goes beyond the ability of communities to cope and requires extensive resource mobilization action⁶. Agencies and rescue teams

at the federal or state level need to be ready for a rescue operation, transfer, and distribution of the needs of the flood victims. The Malaysian Armed Forces (MAF), Royal Malaysian Police, Malaysian Fire and Rescue Department, Civil Defense Department, Social Welfare Department and several other agencies across the country are on standby to assist⁶.

Malaysia Military Armed Forces involvement in disaster and humanitarian missions is an example of military operation not involving the use of threat of force or also known as military operations other than war (MOOTW)⁷. The involvement of medical troops in such event had been seen increasing in recent years especially during floods and environmental health disasters which require some speciality involving military personnel. Royal Medical and Dental Corps had involved in multiple disaster response and humanitarian assistance inside the country and internationally.

Every year, few courses and exercises are being conducted related to disaster management in Malaysia Military Armed Forces training. A yearly course on Pre-Hospital Care and Hospital Disaster Preparedness are being conducted to expose the staff on disaster management. There are also exercises and training related to disaster response with the local government health facilities. Some of the healthcare professional staff also had the opportunity to get involved with international military disaster management exercise such as with Canada, US and China military during bilateral training exercises. However, not all staff get the opportunity to participate in the exercise, training and being exposed on disaster management due to their responsibility and work at their station. This might unfortunately affect the overall knowledge, attitude, and confidence level on disaster management among the healthcare professional in Malaysian Armed Forces Health Service (MAFHS).

Many studies have shown that healthcare staff have low knowledge on disaster management and are not ready to practice during the disaster response once it occurs, but none was conducted among healthcare professional in MAFHS. Thus, we are interested to assess the knowledge, attitude, confidence level and the associated factor that contribute to the preparedness of disaster management among healthcare professional staff of MAFHS. The outcome of this study can further be used to know the level of understanding about disaster management among our staff, to improve the content of current course and to ensure the staff to practice correct and proper disaster management in the future.

CHAPTER 2.0 STUDY PROTOCOL

2.1 INTRODUCTION

Malaysia can be considered as a blessed country as it is spared from severe major natural disaster event such as severe earthquake, volcanic eruption, and typhoon. However, we still face other type of natural disaster like floods, landslides, severe haze and also man-made disaster such as large-scale accident or biochemical hazard contamination¹. Flood accounts for the most frequent natural disaster happened in Malaysia with significant number of human lives lost, disease epidemics, property and crop damage and other losses^{1,2,3}. Malaysia has experienced 51 natural disaster events in the last two decades (1998-August 2018). In that period, 281 people died, over 3 million people were affected, and disasters caused nearly US\$2 billion (MYR8 billion) in damages¹.

Historically, the May 13 Incident (13 May 1969 racial riots) in Kuala Lumpur involving mainly Muslim Malays and non-Muslim Chinese, resulted in the establishment of the National Operation Council (Majlis Gerakan Negara-MAGERAN/NOC) on 16 May 1969 to restore and implement law and order by establishing an unarmed 'Vigilante Corps', a protective army and police force. The Government also declared a national emergency state and suspended Parliament until 1971. When peace was restored, NOC (MAGERAN) was suspended. On 23 February 1971, the Government decided to establish National Security Council (Majlis Keselamatan Negara-MKN) to strengthen the public security and national defense and to maintain public order in the country^{3,6}. In 1972, the Malaysian Government established the Natural Disaster Management and Relief Committee (NDMRC) as a response to severe flooding and the need for a national integrated disaster management system. The NDMRC was responsible for coordinating flood relief operations for

national, state, and district levels and instituting initiatives to reduce damage caused by flood and prevent loss of human life.

The major transformation in the Malaysia Disaster Management Mechanism came only after the tragedy of the luxury condominium of Highland Towers collapsed on 11 December 1993. The noticeable lack of local expertise in specialized rescue operations, improper planning of disaster management and lack of standardized rules and regulation prompted the government to review the existing provisions for disaster management and institute a new mechanism for disaster relief and management³. Ever since, the government began to improve the planning of disaster management, establishing National Security Council Directive No.20, on the Policy and Mechanism on National Disaster Relief and Management. The Directive No.20, the main policy for disaster management in Malaysia, guides agencies across the nation managing disaster and its aftermath. Disaster management in Malaysia is currently run by the National Disaster Management Agency (NADMA). NADMA was officially established 1 October 2015 under the Prime Minister's Department replacing the National Security Council (NSC) as the focal point for disaster management and consolidating the Disaster Management Division of the National Security Council (NSC), the Post Flood Recovery Unity of the Prime Minister's Department, and the Special Malaysia Disaster Assistance and Rescue Agency (SMART)⁴.

What is Disaster? World Health Organization (WHO) define disaster as an occurrence disrupting the normal conditions of existence and causing a level of suffering that exceeds the capacity of adjustment of the affected community⁵. According to MKN 20, A disaster is an event that causes disruption to the activities of public and state affairs, involving loss of life, property damage, economic losses and environmental damage that goes beyond the ability of communities to cope and require extensive

resource mobilization action⁶. Agencies and the rescue teams at the federal level or state need to be ready for a rescue operation, transfer and distribution of the needs for the flood victims. The Malaysian Armed Forces (MAF), Royal Malaysian Police, Malaysian Fire and Rescue Department, Civil Defense Department, Social Welfare Department, and several other agencies across the country are put on standby to provide assistance^{4,6}.

Malaysia Military Armed Forces involvement in disaster and humanitarian mission is an example of military operation not involving the use of threat of force or also known as military operations other than war (MOOTW)⁷. The involvement of medical troops in such event had been seen increasing in recent years especially during floods and environmental health disaster which require some specialty involving military personal. Royal Medical and Dental Corps specifically had involved in multiple disaster response and humanitarian assistance either inside the country and internationally such as⁸:

- a. Tsunami and Earthquake in the district of Flores, Indonesia in 1992
- b. Medical Assistance to war victim refugee in Chamman, Afghanistan in 2001
- c. Tsunami in Aceh, Indonesia in 2004
- d. Earthquake in Battagram, Pakistan in 2005
- e. Earthquake in Yogyakarta, Indonesia in 2006
- f. Cyclone Nargis disaster in Yangon Myanmar in 2008
- g. Earthquake in Padang, Indonesia in 2009
- h. Typhoon Haiyan disaster in Tacloban, Philippines in 2013
- i. Floods in Kemaman, Terengganu in 2013

j. Floods in Manek Urai, Kelantan 2014

k. Medical assistance to Rohingya's refugee in Cox's Bazar, Bangladesh.

Every year, there are few courses and exercise that are being conducted related to disaster management in Malaysia Military Armed Forces training. A yearly course on Pre-Hospital Care and Hospital Disaster Preparedness in Hospital Tentera Darat, Kem Syed Sirajuddin, Gemas involved all level of medical staff are being conducted to expose the staff on disaster management. There are also exercise and training related to Disaster Response with the local government health facilities such as in Pekan, Pahang, Cheneh, Terengganu and Kluang, Johor. Some of the healthcare professional staff also had the opportunity to involve with international military exercise on disaster management such as with Canada, US and China military during bilateral training exercise. However not all staff get the opportunity to participate with the exercise, training and being exposed on disaster management due to their responsibility and work at their station and this might unfortunately affect the overall knowledge, attitude and confidence level on disaster management among the healthcare professional in Malaysian Military.

2.2 PROBLEM STATEMENT & STUDY RATIONALE

Disaster is a major threat that could affect the development of economic, social, and physical elements of a country as well as the well-being of its people. The damage as well as loss of property and life caused by the disaster are overwhelming and least desired by any country. Only by having a good and well-coordinated disaster management plan, such as reducing the risk of disasters, a recovery plan, and a highly prepared response team, can reduce damages and loss of life⁹.

The involvement of military body in disaster response in large scale disaster recently are seems to be increasing in trend¹⁰. Disaster management is a complex system as it involves multi-agencies from different background. It is importance for the healthcare professional staff in Malaysia Military to understand the system and concept of Disaster Management in Malaysia and internationally to ensure a good and well-coordinated disaster management plan can be conducted. However, many studies have shown that healthcare staff still have low knowledge on disaster management and are not ready to practice the disaster response once it occurs, but none was conducted among healthcare professional in Military organization. Thus, we are interested to assess the knowledge, attitude, and confidence level of disaster management among healthcare professional staff of Malaysia Military.

The outcome of this study can further be used to know the level of understanding about disaster management by our staff. It can be used for arranging proper course or improve the content of current course and ensure staff to practice correct and proper disaster management in the future. Thus, it can avoid uncoordinated response towards disaster event and ensure a good and well-coordinated disaster management plan to be conducted properly.

2.3 OBJECTIVES

General objective:

To evaluate the level of knowledge, attitude, and practice of Disaster Management among healthcare professional staff in Malaysia Military and its associated factors.

Specific objectives:

1. To determine the level of knowledge, attitude and confidence on Disaster management among healthcare professional staff in Malaysian Military.
2. To determine the associated factor with knowledge, attitude, and confidence level on Disaster Management among healthcare professional staff in Malaysia Military.

2.4 LITERATURE REVIEW

2.4.1 Knowledge

Disaster is an unplanned event which occurs somewhere in the world almost daily, but these events vary considerably in scope, size and context. Increasing in number of global disasters are posing threats to human health and life. The WHO has called for countries to have detailed plans at all levels to be prepared for disaster that may arise. Healthcare professionals are the front-liner, which will encounter or face this situation either working in pre-hospital and as well as in hospital settings. Thus, in order to contribute under such difficult situations either by saving lives or promoting health awareness during disaster, they need to have the right competencies by having adequate knowledge and self-preparedness.

One study, completed in 2017 regarding knowledge on Emergency and Disaster Management Preparedness among healthcare professional in Yemen using self-reported survey of both web and paper form questionnaires found out only 32% had good

knowledge, 53.5% had fair and 14.5% exhibited poor knowledge. They also found out that educational level was a key factor in the knowledge gap among respondents. Regardless of the period of experience, post graduate staff were more knowledgeable than graduates. Physicians were better in knowledge than other subgroups of specialties. Health administrators seemed insufficiently qualified in emergency and disaster planning. Medical teachers performed better in responding to knowledge tests than managers¹¹. Another study that was conducted in April 2013, among healthcare worker in Tikur Anbesa Specialized Hospital in Ethiopia, to assess the respondent's knowledge awareness and experience concerning disaster and disaster preparedness at their hospital. About 50.8% of health care workers at the hospital had a good knowledge about disaster and hospital disaster preparedness while the remaining 49.2% had low knowledge¹².

Regarding Disaster related to chemical, biological, radiation, nuclear and explosion (CBRNe), There are study that was conducted among emergency medical services (EMS) in Canada to assess knowledge and practical preparedness training regarding CBRNe. The results of this study identify a significant lack of knowledge and preparedness for situations involving a CBRNe agent. Out of 889 respondents, 329 (37%) had never received either theoretical or practical CBRNE training to work in a contaminated environment¹³. Another study was conducted in Poland from January to December 2012. The aim of this study was to evaluate the knowledge of physicians, nurses, and paramedics in Poland about the procedure in chemical contamination. The survey was distributed via internet to 600 people working in hospital emergency units and in emergency medical teams throughout Poland. The survey included questions concerning the procedure of decontamination, toxidromes knowledge and the use of selected antidotes. Completed surveys were received from 510 respondents (85%). They

found out a very low level of knowledge was observed regarding decontamination techniques (from 8.3% to 34.2%), use of antidotes (from 13.7% to 61%), toxidromes knowledge (from 10.2% to 22.7%). The author concluded that the knowledge of medical personnel related to the chemical rescue procedures queried was not satisfactory¹⁴.

In Saudi Arabia, a study was conducted in Tertiary care hospital in Riyadh, Kingdom of Saudi Arabia where 189 participants have completed the questionnaire. Two-third of the participants were below 30 years, and more than 85% were female. One hundred and eleven (58.7%) had a clinical experience of more than 5 years, while 78 (41.3%) participants had more than 3 years of clinical service. Correct responses of knowledge towards disaster and emergency preparedness score were 6.2 ± 2.5 . Participants with more than 5-years of experience had a statistically significant ($p=0.009$) knowledge scale score for disaster and emergency preparedness¹⁵.

In Malaysia, a study regarding disaster management among emergency nurse and community health nurse was conducted in emergency departments and health clinics in Selangor. They found that both groups of nurses had similar inadequate knowledge but portrayed positive attitude towards disaster management. They differ in terms of practice whereby 56.1% of emergency nurses reported having had adequate practice compared to 30.7% of the community health nurses (chi squared test, $P<0.001$). Emergency nurses who have been involved in disaster response are more likely to report adequate practice ($P<0.01$, AOR=4.008, 95% CI=1.691-9.504) while those who attended disaster-related education/training are more likely to have adequate knowledge ($P<0.05$, AOR=3.807, 95% CI=1.584-9.153) and practice ($P=0.001$, AOR=4.145, 95% CI=1.804- 9.525). Attending disaster-related education/training is seen to be a predictor to adequate knowledge ($P<0.001$, AOR=3.511, 95% CI=2.097-5.881) among

community health nurses. Nurse's workplace (represent type of nurse) is identified as a predictor for adequate of practice ($P < 0.001$, AOR=2.345, 95% CI=1.474-3.730¹⁶).

Another recent study among nurses is a study on nurse's knowledge, attitude and practice during flood disaster affected EAST COAST region in Malaysia. This study was conducted using a questionnaire and a total of 197 participants participated from three hospitals. Regarding the knowledge of participants on disaster management, 73% of participants heard about disaster management before, whereas 27% of them did not. A total of 92% of them know what disaster is and 96% of them know what involve in disaster management. In addition, 96% of them know a flood is a natural disaster; however, only 47.2% of the participants understand famine is a type of man-made disaster. Moreover, 60% of them do not know the phases of disaster management based on Malaysia guidelines and 52% of them do not know mitigation activities takes place before disaster happen. Only 53% know water level monitoring is an activity in the mitigation phase. A total of 80% of the participants know preparedness activities take place during a disaster event. Altogether 69% of the participants understand field simulation of disaster management plan is an activity in the preparedness and 80% of them know response is to put preparedness plans into action. Only 38% know disaster response shall involve the Ministry of Health and involvement of other private health care systems. A total of 75% of the participants know activities in recovery phase take place during a disaster event and 88% of them understand recovery includes actions taken to return to a normal or an even safer situation. Altogether 91% of the participants know water supply and sanitation can have impact to health that result from disaster, and only 66% of them understand disaster will increase risk of developing communicable disease. In addition, 83% of the participants know population displacement can cause social burden to inhabitants¹⁷.

2.4.2 Attitude

A study conducted in Tertiary health care hospital in central Riyadh, Kingdom of Saudi Arabia demonstrates attitude of respondents towards disaster and emergency preparedness. Around 12 (6.3%) participants were not interested in being aware of the emergency (disaster) operational plans, and approximately 21 (11%) agreed that disaster management and planning is for a few people in the hospital. Furthermore, 66 (34.9%) participants believed that disasters are unlikely to happen in their hospital. The complete consensus was obtained among the participants on the necessity to have an emergency (disaster) operational plan as well as to conduct drills in the hospital, while 186 (98.4%) patients believed that training is necessary for all healthcare workers ¹⁵.

There is also a Questionnaire Study on the Attitudes and Previous Experience of Croatian Family Physicians toward their Preparedness for Disaster Management from 1st to 31st January 2017. The study results shows that risk awareness of disasters was high among respondents ($M=4.89$, $SD=0.450$). Only 16.4 of respondents have participated in the management of disaster at the scene. The majority (73.8%) of physicians have not been participating in any educational activity dealing with disaster over the past two years. Family physicians believed they are not well prepared to participate in national ($M=3.02$, $SD=0.856$) and local community emergency response system for disaster ($M=3.16$, $SD=1.119$). Male physicians scored higher preparedness to participate in national emergency response system for disaster ($p=0.012$), to carry out accepted triage principles used in the disaster situation ($p=0.003$) and recognize differences in health assessments indicating potential exposure to specific agents ($p=0.001$) compared to their female colleagues¹⁸.

Another cross-sectional study done conducted among Yemeni Health Professional on knowledge and attitude on emergency and disaster management training. The study

concluded that the respondent's attitude toward disaster management was generally positive. Of study participants, 84.9% agreed to the teaching of disaster management in the country. They want to have an emergency plan, to know their roles during the response to emergency events, as well as wanting to train in disaster Planning. The findings also elicited that the level of attitude regarding disaster planning among the health professions was statistically different. Postgraduates agreed with most attitude questions compared to graduates ($p < 0.05$). The length of experience seemed to have no effect on the professional attitude towards disaster management. However, those who had worked a long time appeared slightly more eager for training and the implementation of an emergency plan in their workplaces. Health administrators were interested in implementing simulation-training programs in their facilities. They considered that hands-on or field exercises and workshops were an appropriate method in disaster training rather than lectures and presentations ($p < 0.05$). Physicians preferred to know their role during disaster and emergency responses in their workplaces ($p < 0.05$). Among the careers, medical teachers appeared higher in attitude to disaster management, in terms of risk analysis, planning and committee supervision ($p < 0.05$). Leaders or managers were higher in attitude to hospital and field hands-on training (11). This finding was similar among nurses working in emergency department in Malaysia, but the positive attitude is driven by being involved in disaster response and attending disaster-related education ¹⁶.

Regarding willingness to work during disasters, few literatures reported majority of health care providers were willing to work during disaster, but it will be depending on type of disasters. A study done in New Haven, USA found that 87% of hospital employees were willing to work after a fire, rescue or collapse mass casualty incident. Respondents were otherwise less willing to work in response to a man-made disaster

such as biological event (58%), chemical event (58%) or radiation event (57%) than a natural disaster such as in snowstorm (83%), flood (75%), hurricane (78%), earthquake (79%), tornado (77%), ice storm (75%) and flu pandemic (72%)¹⁹. However, another survey among emergency physicians at 7 US teaching institutions reported 54.1% of respondents were willing to report for duty in a natural disaster and 91.3% for nonnuclear explosive disaster ²⁰. In Australia, 97.7% of emergency nurses were willing to attend their workplace during a disaster ²¹.

2.4.3 Confidence level to Practice

A major incident is any emergency that requires special arrangements by the emergency services and generally involves many people. Recent such events in England included the Manchester Arena bombing and the Grenfell Tower disaster have required hospital by law to keep a major incident plan (MIP) outlining the response to such an event. In a survey conducted in 2006²², found a substantial knowledge gap among key individuals that would be expected to respond to the enactment of an MIP. After 12 years they repeat this survey study and assess any improvement since their first original report. NHS trusts were identified in England which received more than 30 000 patients through the emergency department in the fourth quarter of the 2016/2017 period. They contacted the on-call anesthetic, emergency, general surgery, and trauma and orthopedic registrar at each location and asked each individual to answer a short verbal survey assessing their confidence in using their hospital's MIP. Results Of those eligible for the study (296 registrars), 62% (186 registrars) were able to be contacted and consented to the study. In total, 50% of respondents had read all or part of their hospital's MIP, 46.8% were confident that they knew where their plan was stored, and 36% knew the role they would play if a plan came into effect. The greatest number of responses came from trauma and orthopedics registrars, while emergency medicine registrars were

generally the most confident in using the MIP. These results show less confidence among middle-grade doctors compared with 2006. They conclude that confidence in using MIPs among specialty registrars in England is still low²³.

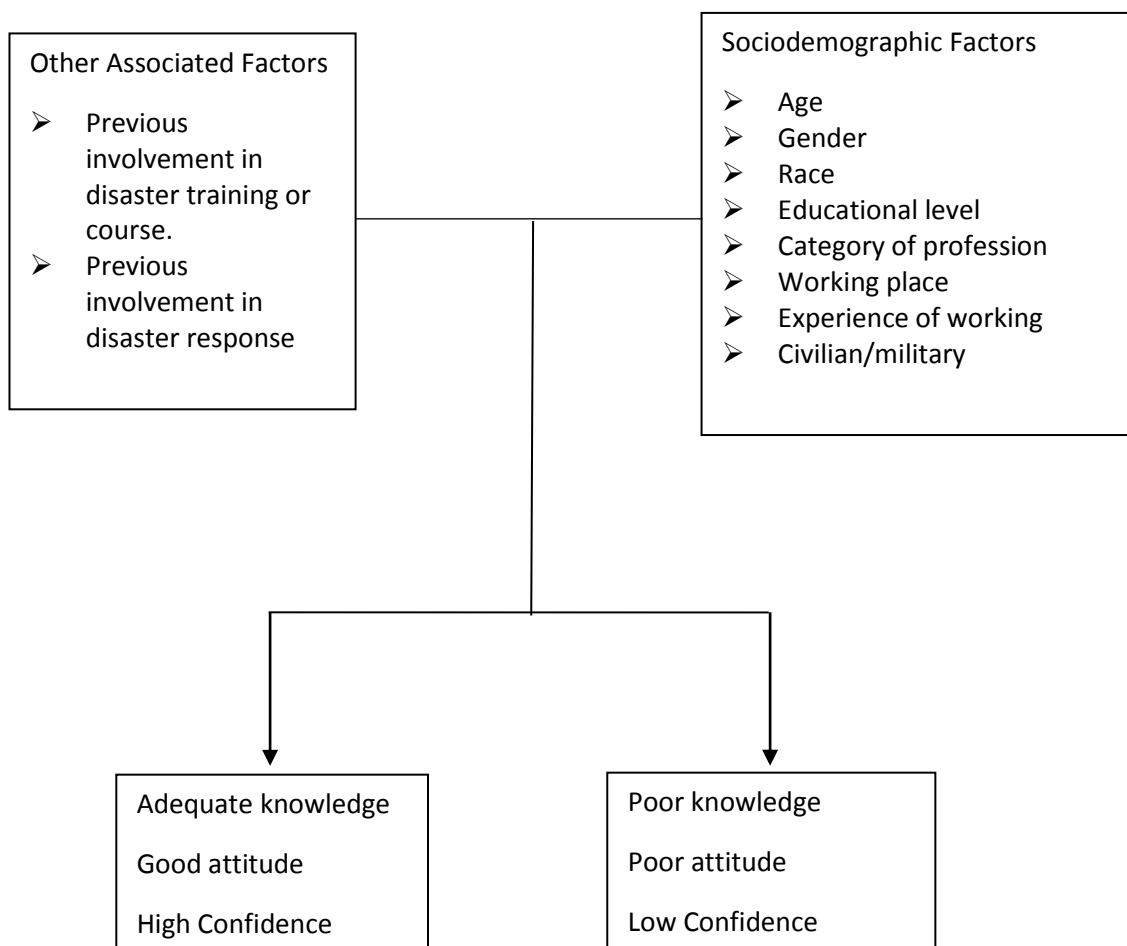
There's another study that was conducted to assess the current status of awareness and training of junior medical staff in the Wessex region in the event of a 'conventional' major incident. A telephone questionnaire of specialist registrars (SpRs) (or equivalent, for example, staff grade) in six core specialties was performed in all the 11 acute hospitals in the Wessex region on the same evening. This group was selected to represent a sample of the most senior medical staff 'on site' at each hospital. 56 of 64 (87.5%) SpRs participated in the study. Nine of the 56 (16%) SpRs questioned had previously been involved in a major incident, and 18 (32%) had experienced some form of major incident training exercise. Subgroup analysis of the specialties showed that although there were no significant differences in numbers of training experiences between specialties, only one of nine (11%) orthopedic SpRs had ever been involved in a training exercise. Twenty-five of the 56 (45%) SpRs felt that they were confident of their role in the event of an incident. They conclude that most middle grade staff in Wessex were not confident of their role in the event of a major incident. Most SpRs questioned had never attended a major incident training exercise²⁴.

Another survey was conducted among members of the American Pediatric Surgical Association in 2007. The authors explored four domains in this survey: demographics, disaster experience and perceived preparedness, attitudes regarding responsibility and willingness to participate in a disaster response, and availability to participate in a disaster response. The authors sent 725 invitations and received 265 (36.6 percent) completed surveys. Overall, the authors found that 77 percent of the respondents felt "definitely" responsible for helping during a disaster but only 24

percent of respondents felt "definitely" prepared to respond to a disaster. Most felt they needed additional training, with 74 percent stating that they probably needed to do more training. Among experiential factors, the authors found that attendance at a national conference was associated with the highest sense of preparedness. The authors determined that subjects with actual disaster experience were about four times more likely to feel prepared than those with no disaster experience ($p < 0.001$). The authors also demonstrated that individuals with a defined leadership position in a disaster response plan are twice as likely to feel prepared ($p = 0.002$) and nearly five times more willing to respond to a disaster than those without a leadership role ²⁵.

2.5 CONCEPTUAL FRAMEWORK

This conceptual framework shows the possible factors associated with good disaster management and preparedness in Malaysian Military Healthcare professional. The sociodemographic factors (age, gender, race, educational level, category of profession, working place, experience/ years of working in military health care service) and other associated factors (previous involvement in disaster training/course and previous involvement in disaster response) would contribute to the level of knowledge on disaster management, the attitude towards disaster management and confidence level in managing disaster.



2.6 RESEARCH DESIGN

This is a cross-sectional study.

2.7 STUDY AREA

This study will be conducted in 3 tertiary hospitals under Malaysia Military Health Facility in peninsular Malaysia which are Hospital Angkatan Tentera Tuanku Mizan (HATTM) in Wangsa Maju, Kuala Lumpur, 94 Hospital Angkatan Tentera, Terendak (94 HAT) in Melaka and 96 Hospital Angkatan Tentera, Lumut (96 HAT) in Perak. These three hospitals serve as a tertiary for military health care facilities.

2.8 STUDY POPULATION

Reference population

All healthcare professional worker in Malaysia Military

Source population

All healthcare professional that involves in clinical and pre-hospital work in three tertiary hospitals under Malaysia Military Health Facility in peninsula Malaysia. Malaysia military health facility consists of staff who are military in background and supported by civilian healthcare professional that are working in Malaysia Military Hospital as staff nurse and assistant medical officer.

Sample frame

All clinical specialist, medical officers, assistant medical officers, and staff nurses that are currently working in Hospital under Malaysian Military Health Facility in peninsular Malaysia.

2.9 SUBJECT CRITERIA

Inclusion Criteria

All healthcare professional staff under Hospital in Malaysia Military Health Facility at point of study

Exclusion Criteria

Staff who is on leave during the study period either study leave or maternity leave, non-clinical staff, Houseman officer, Dental Officer/Specialist, Pharmacist, Worked less than 6 months in Royal Medical and Dental Corps

2.10 SAMPLE SIZE ESTIMATION

Sample size estimation:

Sample size estimation will be done in accordance with the study objectives.

Objective 1: To determine the level of knowledge, attitude and confidence on disaster management among healthcare professional staff in Malaysian Military.

The sample size for objective 1 is calculated by using single proportion formula:

$$n = \frac{(z^2_{1-\alpha/2})(P)(1-P)}{d^2}$$

$z^2_{1-\alpha/2}$:1.96

P :Estimated proportion from literature

D :0.10, margin of error (precision)

Table 1: Sample size calculation for objective 1.

Variables	d	P	N	n + 10% dropout rate	Literature
Knowledge	0.10	0.57	95	119	Ahayalimudin and Osman, 2016 ²⁶
Attitudes	0.10	0.90	35	44	Ahayalimudin and Osman, 2016 ²⁶
Confidence	0.10	0.54	96	120	Wong <i>et al.</i> , 2006 ²²

Objective 2: To determine the associated factor with knowledge, attitude and confidence level on disaster Management among healthcare professional staff in Malaysian Military.

The sample size for objective 2 is calculated for each variable of associated factors for good knowledge/positive attitude/high confidence using Power and Sample Size calculation software to compare two independent proportions. Table 2 below shows the summary of sample calculation for objective 2.

Table 2: Summary of sample size calculation for objective 2.

Factors	P0	P1	m	n	2n+10%	Literature
Male gender	0.30	0.55	1	60	132	Ahayalimudin and Osman, 2016 ²⁶
Higher education level	0.50	0.30	1	93	205	Susila <i>et al.</i> , 2019 ²⁷
Longer working duration	0.51	0.30	1	85	187	Susila <i>et al.</i> , 2019 ²⁷
Older age	0.47	0.25	1	74	163	Susila <i>et al.</i> , 2019 ²⁷
Medical profession	0.50	0.30	1	93	205	Susila <i>et al.</i> , 2019 ²⁷

P0 : Proportion of poor knowledge/poor attitude/low confidence by exposure or factors obtained from literature.

P1 : Expert opinion on estimated proportion of good knowledge/good attitude/high confidence by exposure or factors studied.

α : Value of the standard normal distribution cutting off probability α (1.96 for $\alpha = 0.05$ (two-tailed))

β : Value of the standard normal distribution cutting off probability β (0.84 for 80% power)

m : Ratio = 1:1

In conclusion, the largest calculated sample size among all study objectives is 205 samples. Therefore, at least 205 samples are required for this study.

2.11 SAMPLING METHOD AND SUBJECT RECRUITMENT

In this study, stratified random sampling was used as the study was conducted in 3 different hospitals. The amount of sample or correspondent for each hospital was predetermined to ensure appropriate distribution across hospital and professional groups.

The proportion was estimated based on the total number of healthcare professional from each hospital obtained from admin officer from each hospital. There were about 643 staff was estimated to be included in the study which fulfilled the inclusion and exclusion criteria, and 205 questionnaires will be distributed among them. Stratified random sampling was chosen to make sure equal proportion for each hospital and each category of variables according to group of profession. The personnel in each category for each hospital will be chosen by table of random sampling.

TABLE 3: Weightage proportion according to healthcare professionals in 3 Military Hospital in Peninsula Malaysia.

	HATTM	94 HAT	96 HAT	Total (n)	Weightage (%)	SAMPLE (n)*
Specialist	37	17	10	64	9.95	20
Medical officer	39	8	8	55	8.55	18
Assistant Medical officer	45	17	15	77	11.98	24
Staff Nurse	231	115	101	447	69.52	143
Total(n)/ Weightage (%)	352 (54.74%)	157 (24.41%)	134 (20.83%)	643	100	205
SAMPLE (n)*	112	50	43		-	205

Note: * Rounded to no decimal point

As per calculation, 54.74% (112 set) of the questionnaire will be distributed among 352 healthcare professional staff in HATTM, 24.41% (50 set) of the questionnaire will be distributed among 157 healthcare professional staff in 94 HAT Terendak and another 20.83 % (43 set) of the questionnaire will be distributed among 134 healthcare professional staff in 96 HAT Lumut.

Detail distribution of questionnaire for each category in the listed hospital are as follows:

TABLE 4: Weightage proportion according to healthcare professionals HATTM

	Numbers (n)	Percentage/ Weightage	Sample (n)
Specialist	37	10.51	12
Medical officer	39	11.08	12
Assistant Medical officer	45	12.78	14
Staff Nurse	231	65.62	74
Total	352	100	112

Note: * Rounded to no decimal point

TABLE 5: Weightage proportion according to healthcare professionals in 94 HAT

	Numbers (n)	Percentage/ Weightage	Sample (n)
Specialist	17	10.82	5
Medical officer	8	5.10	3
Assistant Medical officer	17	10.83	5
Staff Nurse	115	73.25	37
Total	157	100	50

Note: * Rounded to no decimal point

TABLE 6: Weightage proportion according to healthcare professionals in 96 HAT

	Numbers (n)	Percentage/ Weightage	Sample (n)
Specialist	10	7.46	3
Medical officer	8	5.97	3
Assistant Medical officer	15	11.2	5
Staff Nurse	101	75.37	32
Total	134	100	43

Note: * Rounded to no decimal point

2.12 RESEARCH TOOL

Data collection will be done using a questionnaire from a validated survey, adapted from Mustafa MS²⁸ with Cronbach alpha on assessment of knowledge was 0.82, assessment on attitude was 0.72 and assessment on confidence level which was 0.93 on disaster management among doctors in Terengganu. The questionnaire comprises of 31 questions, and they are divided into 4 sections, namely demographic, knowledge, attitude, and confidence level regarding disaster management.

First section includes the demographic data of the respondents which is gender, age, race, category of profession, previous place of graduation/study, total duration/years of working in Malaysia Military health care service including previous involvement in disaster training/course and previous involvement in disaster response.

Second to fourth section consist of 31 questions about knowledge, attitude and confidence level on disaster management.

- A. In the section regarding knowledge questions, 3 main topics of disaster management will be tested include the knowledge of disaster management under directive no. 20 (K1-K7), triage (K8-K9) and hospital activation phase (K10-K14). K stands for 'knowledge questions' and numbered accordingly. Questions on knowledge will be answered on a Likert scale of three.

- 2 Point: true answer
- 1 Point: don't know/unsure
- 0 point: wrong answer

There are fourteen knowledge questions. The minimum score will be 0 and maximum score will be 28. The knowledge score will be presented by means and further subdivided into good scoring if total score 90% and above, average 50%-90% and poor score if less than 50% ^{28,29}.